PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference C50003PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 02/07226	International filing date *(day/month/year)* 01.07.2002	Priority date *(day/month/year)* 01.07.2002
International Patent Classification (IPC) or both national classification and IPC G01R35/00		
Applicant EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH CERN		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13.01.2004	11.06.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Böhm-Pélissier, A Telephone No. +49 89 2399-2495

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 02/07226

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

3-19	as originally filed
1, 1a, 2	received on 25.03.2004 with letter of 24.03.2004

Claims, Numbers

1-23	as originally filed

Drawings, Sheets

1/4-4/4	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-23
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-23
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-23
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Citations:

D1: EP 0 756 179 A
D2: US 4 767 988 A
D3: US 5 990 679 A
D4: US 4 338 810 A
D5: US 4 622 644 A (all cited in the description)

2. **Article 33(2) PCT (novelty)**

2.1 Claim 1:

The present application is related to a magnetic calibration device for calibrating a magnetic field sensor with a high precision. This is principally achieved by three coils on a coil card rotated around two orthogonal axes and processing means for calculating the exact value of the three components of the magnetic field measured inductively by the three coils during rotation.

D1, which is considered to represent the closest prior art, discloses a triple-axis magnetic sensor, an analog to digital converter (ADC), a current source, a processing unit and means for generating a calibration magnetic field. D1 further discloses rotating the sensor for calibration purpose.

D1 does not disclose the use of additional sensing means in form of a coil card comprising three coils arranged substantially orthogonal to each other in order to measure the three components of a magnetic field during rotation.

Furthermore, D1 does not disclose the electronic circuitry connected to the coil card and a second ADC as well as means for guiding the signals provided by the coil card.

Consequently, the subject matter of claim 1 is novel.

2.1 Consequently, the subject-matter of Claims 2-23 dependent upon claim 1 is also novel.

3. **Article 33(3) PCT (inventive step)**

3.1 Claim 1:

Since in D1 the magnetic field is directly measured by means of the sensor, D1 neither teaches the use of a coil card with three coils arranged substantially orthogonal to each other in order to measure the three components of a magnetic field during rotation nor suggests providing a rotator for rotating both the coil card and the sensor card around two orthogonal axes.

D2 discloses a magnetometer using three orthogonal coils for determining the orientation of a platform. D2 does not disclose the context of a magnetic calibration device as well as many technical features of present claim 1 (i.e. sensor card, coil card and rotating both together, ADC etc.).
D3 is related to a magnetic gradiometer.
D4 concerns a device for detecting small changes in the magnetic fields.
D5 concerns a magnetic position and orientation measurement system. D2-D5 are not suitable for calibrating a magnetic sensor.

Consequently, the subject-matter of claim 1 is inventive.

3.2 Consequently, the subject-matter of Claims 2-23 dependent upon claim 1 is also inventive.

Comment:
When entering the regional phase claim 1 should be drafted in the two-part form (Rule 29(1) EPC) and in claim 1 the unclarity "rotating said cards" should be replaced by "rotating together said cards" and in claim 14 "process unit" should be replaced by "processing unit". In the description the last sentence on page 13 should be removed (Article 84 EPC).